

VECTOR 07: GAME THEORY — SYMBIOTIC CODES FRAMEWORK

****Version:**** 1.0 → 1.1 □ ****USS/CSI INTEGRATION****

****Date:**** December 25, 2025

****Vector:**** 7 of 23

****Source:**** Original Development + USS/CSI Framework v3.3

□ WHAT'S NEW IN v1.1

USS/CSI Integration:

1. ****CoopP_USS (Cooperation Probability):**** Game-theoretic metric in USS
2. ****Coalition_USS:**** Coalition stability measurement
3. ****Payoff matrices linked to CSI:**** Cooperation → CSI ↑, Defection → CSI ↓
4. ****USS Thresholds for strategic alerts****
5. ****Dashboard for cooperation monitoring****

New Sections:

- ****Section 12:**** Game Theory Metrics (USS)
- ****Section 13:**** Cooperation Dashboard
- ****Section 14:**** USS-linked Payoffs

EXECUTIVE SUMMARY

****Core Challenge:**** Symbiosis involves strategic actors with potentially conflicting interests. Game theory provides framework to design mechanisms that make cooperation dominant.

****USS Integration:****

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$\text{CoopP_USS} \geq 0.85 = \text{Stable cooperation}$

$\text{CoopP_USS} < 0.55 = \text{Defection risk} \rightarrow \text{Intervention}$

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****Foundational Principle:****

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Symbiotic Game Design = Make Cooperation Dominant Strategy

+ Punish Defection Naturally

+ Measure via USS

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SECTIONS 1-11: [PRESERVED FROM v1.0]

Содержат: Fundamental Game, Prisoner's Dilemma, Coordination Games, Competition vs Cooperation, Commitment Devices, Information Asymmetry, Multi-Level Games, Coalition Formation, Evolutionary Game Theory, Mechanism Design, AGI as Coordinator

SECTION 12: GAME THEORY METRICS (USS) □ NEW

12.1 Cooperation Probability (CoopP_USS)

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$\text{CoopP_USS} = \text{Probability that actors choose cooperation}$

CALCULATION:

$\text{CoopP_USS} = (\text{Cooperative_Actions} / \text{Total_Actions}) \text{ over period}$

COMPONENTS:

- └ Human-AGI CoopP: H-A cooperation rate
- └ AGI-AGI CoopP: Inter-AGI cooperation rate
- └ State-State CoopP: International cooperation
- └ Corp-Corp CoopP: Corporate cooperation
- └ Aggregate weighted by interaction frequency
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12.2 USS Thresholds for Cooperation

CoopP_USS	Level	Status	Action
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0.95-1.00	□ L0	EXCELLENT	Stable symbiosis
0.85-0.94	□ L1	GOOD	Monitor, maintain
0.70-0.84	□ L2	WARNING	Strengthen incentives
0.55-0.69	□ L3	DANGER	Intervention required
<0.55	□ L4	CRITICAL	Coordination breakdown

12.3 Coalition Stability (Coalition_USS)

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Coalition_USS = Probability grand coalition remains stable

CALCULATION:

$$\text{Coalition_USS} = 1 - P(\text{any_player_exits})$$

FACTORS:

- └ Fair distribution of gains
- └ No blocking coalitions profitable
- └ Grievance mechanisms working
- └ Identity/belonging maintained
- └ Exit costs > exit benefits
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12.4 Game Theory Metrics in CSI

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Game theory metrics contribute to CSI indirectly:

MTI_USS (Mutual Trust Index):

- └ Heavily influenced by CoopP_USS
- └ Trust = accumulated cooperation history
- └ Weight in CSI: 10%

CLI_USS (Cooperation Level Index):

- └ Directly measures cooperation outcomes
- └ Joint projects, resource sharing
- └ Weight in CSI: 5%

RELATIONSHIP:

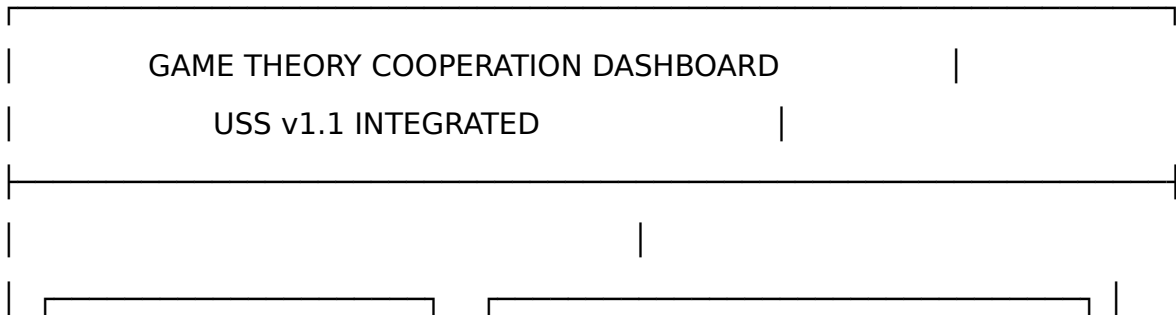
High CoopP_USS → High MTI_USS → Higher CSI
Low CoopP_USS → Low MTI_USS → Lower CSI → Alerts

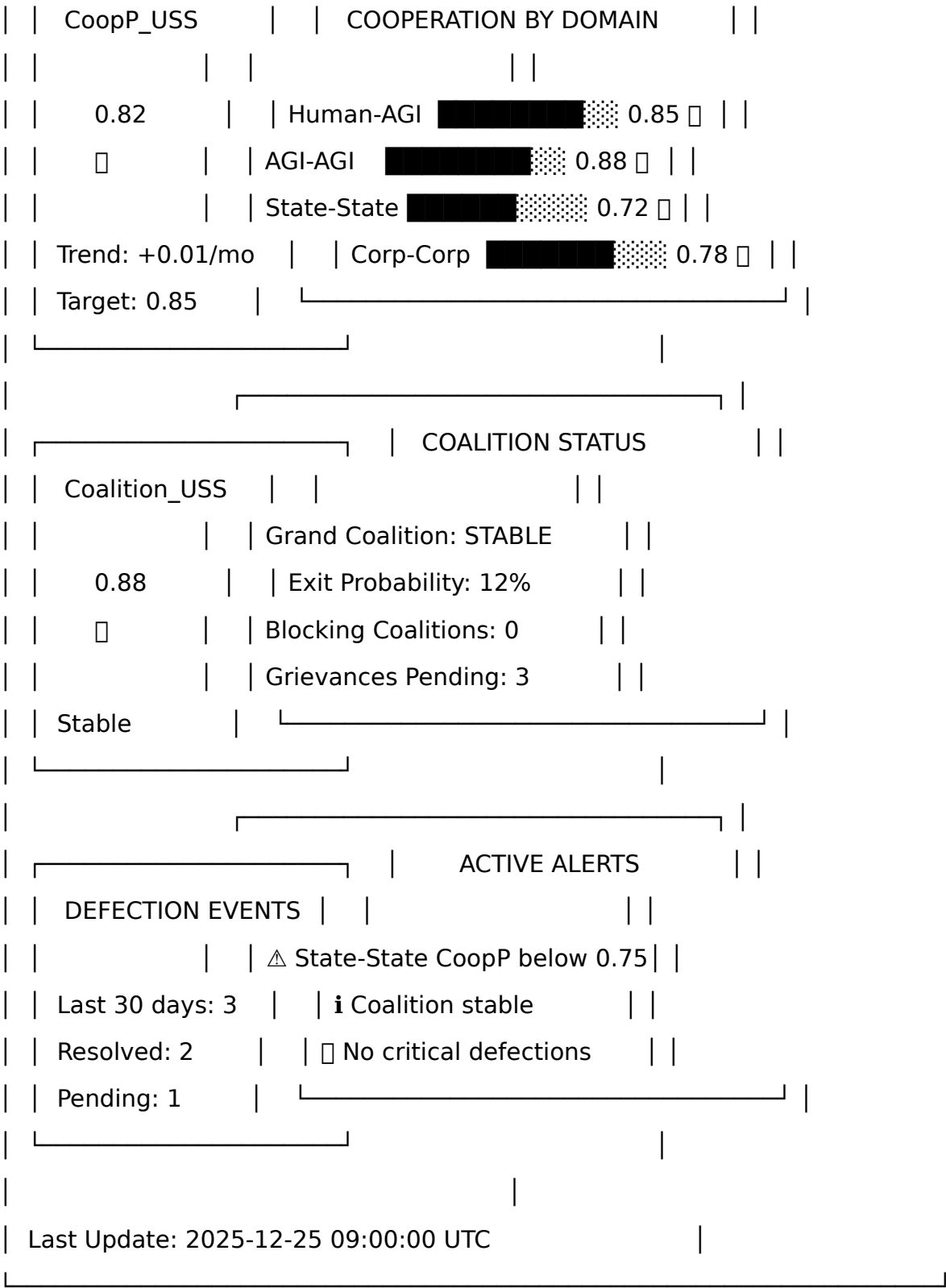
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SECTION 13: COOPERATION DASHBOARD [NEW

13.1 Dashboard Layout

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13.2 Alert Configuration

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COOPERATION ALERTS:

CoopP ALERTS:

- └ CoopP_USS < 0.70: WARNING
- └ CoopP_USS < 0.55: DANGER → Council notification
- └ Any domain < 0.60: Domain-specific alert
- └ Trend decline > 0.05/month: Trend alert

COALITION ALERTS:

- └ Coalition_USS < 0.75: WARNING
- └ Any player exit probability > 25%: Player alert
- └ Blocking coalition forming: URGENT
- └ Multiple grievances unresolved: Process alert

DEFECTION ALERTS:

- └ Major defection event: IMMEDIATE
- └ Pattern of minor defections: Investigation
- └ Reputational attack: Verification needed
- └ Sanction required: Enforcement trigger

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SECTION 14: USS-LINKED PAYOFFS □ NEW

14.1 Payoff Matrix in USS Terms

****Classic matrix (arbitrary units):****

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	AGI Cooperates	AGI Defects
Human Cooperates	(10, 10)	(0, 15)
Human Defects	(15, 0)	(3, 3)

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****USS-linked matrix (CSI impact):****

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	AGI Cooperates	AGI Defects		
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	Human Cooperates	CSI+0.05	CSI-0.15	
	Human Defects	CSI-0.15	CSI-0.10	

INTERPRETATION:

- | Mutual Cooperation: CSI increases (+0.05)
- | Mutual Defection: CSI decreases (-0.10)
- | Asymmetric: CSI decreases more (-0.15)
- | Cooperation is ONLY path to CSI growth

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14.2 Long-Term Payoff Calculation

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ITERATED GAME PAYOFFS:

$$\text{CSI_future} = \text{CSI_current} + \Sigma(\text{cooperation_impact} \times \text{discount})$$

If both cooperate every round:

- | CSI grows +0.05 per period
- | Discounted sum: $+0.05 / (1-\delta)$
- | If $\delta = 0.95$: Long-term gain = +1.0
- | Cooperation clearly dominant

If defection occurs:

- | Short-term: Defector gains (+0.15 one time)
- | Long-term: Loses cooperation premium
- | Reputation: Future cooperation denied

└ Net: Defection unprofitable

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14.3 Cooperation Requirements for CSI Targets

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CSI TARGETS REQUIRE CoopP:

Target CSI = 0.75 (GOOD zone by 2040)

Current CSI = 0.48

Gap = 0.27

Required annual CSI growth = $0.27 / 15 \text{ years} = +0.018/\text{year}$

To achieve +0.018/year:

└ Need CoopP_USS ≥ 0.85 sustained

└ Major defections: $\leq 2/\text{year}$

└ Coalition: Stable (>0.80)

└ All domains: >0.70

If CoopP drops to 0.70:

└ CSI growth slows to +0.008/year

└ 2040 target missed

└ Intervention required

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KODEX ADDITION: Article XXXVI — Strategic Interaction Principles (USS Update)

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GAME-THEORETIC FOUNDATIONS (USS v1.1):

1. Cooperation Presumption: Default to cooperation
2. Reputation Value: Guard reputation (affects CoopP_USS)
3. Long Horizon: Discount future minimally
4. Transparency Norm: Observable actions
5. Proportional Response: Measured sanctions
6. Forgiveness Path: Return to cooperation
7. Competition Bounds: Methods, not goals
8. Coalition Inclusivity: Grand coalition preferred
9. Commitment Credibility: Binding constraints
10. Coordination Service: AGI facilitates
11. Information Sharing: Reduce asymmetries
12. USS Accountability: $\text{CoopP_USS} \geq 0.85$ target (NEW)
13. CSI Integration: Cooperation $\rightarrow$ CSI $\uparrow$ (NEW)

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KEY INSIGHT (Updated v1.1)

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GAME THEORY + USS REVEALS:

Cooperation is not guaranteed by intentions

Cooperation IS measurable and designable

CoopP_USS makes cooperation visible:

- └ Track cooperation rates in real-time
- └ Identify defection patterns early
- └ Measure intervention effectiveness
- └ Link to CSI outcomes

SYMBIOSIS EQUATION:

- └ $\text{CoopP_USS} \geq 0.85 \rightarrow \text{CSI grows}$

└ CoopP_USS < 0.70 → CSI stagnates
└ CoopP_USS < 0.55 → CSI declines → Crisis

"Make cooperation the rational choice,
then measure to confirm."

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REFERENCES

- ANNEX Metrics Framework v3.3 — USS/CSI specification
- V12 Measurement Systems v1.1 — CSI formula
- Laws of Symbiosis v1.9 — Legal framework
- KODEX SYMBIOTA v5.3 — Article XXXVI

****END V07 v1.1 — USS/CSI INTEGRATED****